IN THE SPECIFICATION:

Please amend the second paragraph on page 1 as follows:

The present invention relates to complexes of transition metals or alkaline earth metals ~~which~~ that are capable of combusting to generate gases. More particularly, the present invention relates to providing such complexes ~~which~~ that rapidly oxidize to produce significant quantities of gases, particularly water vapor and nitrogen.

Please amend the third paragraph on page 1 as follows:

~~Gas generating~~ Gas-generating chemical compositions are useful in a number of different contexts. One important use for such compositions is in the operation of "air bags." Air bags are gaining in acceptance to the point that many, if not most, new automobiles are equipped with such devices. Indeed, many new automobiles are equipped with multiple air bags to protect the driver and passengers.

Please amend the first paragraph on page 2 as follows:

There are a number of additional important design criteria that must be satisfied. Automobile manufacturers and others have set forth the required criteria ~~which~~ that must be met in detailed specifications. Preparing ~~gas generating~~ gas-generating compositions that meet these important design criteria is an extremely difficult task. These specifications require that the ~~gas generating~~ gas-generating composition produce gas at a required rate. The specifications also place strict limits on the generation of toxic or harmful gases or solids. Examples of restricted gases include carbon monoxide, carbon dioxide, NO_x, SO_x and hydrogen sulfide.

Please amend the paragraph bridging pages 3 and 4 as follows:

At present, sodium azide is the most widely used and currently accepted ~~gas generating~~ gas-generating material. Sodium azide nominally meets industry specifications and guidelines. Nevertheless, sodium azide presents a number of persistent problems. Sodium azide is highly toxic as a starting material, since its toxicity level as measured by oral rat LD_{50} is in the range of

45 mg/kg. Workers who regularly handle sodium azide have experienced various health ~~problems~~ problems, such as severe headaches, shortness of breath, convulsions, and other symptoms.

Please amend the first paragraph on page 4 as follows:

In addition, no matter what auxiliary oxidizer is employed, the combustion products from a sodium azide gas generant include caustic reaction products such as sodium oxide, or sodium hydroxide. Molybdenum disulfide or sulfur has been used as ~~oxidizers~~ an oxidizer for sodium azide. However, use of such oxidizers results in toxic ~~products~~ products, such as hydrogen sulfide gas and corrosive materials such as sodium oxide and sodium sulfide. Rescue workers and automobile occupants have complained about both the hydrogen sulfide gas and the corrosive powder produced by the operation of sodium ~~azide-based~~ azide-based gas generants.

Please amend the second paragraph on page 4 as follows:

Increasing problems are also anticipated in relation to disposal of unused gas-inflated supplemental restraint systems, ~~e.g.~~ e.g., automobile air bags, in demolished cars. The sodium azide remaining in such supplemental restraint systems can leach out of the demolished car to become a water pollutant or toxic waste. Indeed, some have expressed concern that sodium azide might form explosive heavy metal azides or hydrazoic acid when contacted with battery acids following disposal.

Please amend the first paragraph on page 5 as follows:

It will be appreciated, therefore, that there are a number of important criteria for selecting ~~gas generating~~ gas-generating compositions for use in automobile supplemental restraint systems. For example, it is important to select starting materials that are not toxic. At the same time, the combustion products must not be toxic or harmful. In this regard, industry standards limit the allowable amounts of various gases and particulates produced by the operation of supplemental restraint systems.

Please amend the second paragraph on page 5 as follows:

It would, therefore, be a significant advance to provide compositions capable of generating large quantities of gas that would overcome the problems identified in the existing art. It would be a further advance to provide a ~~gas generating~~ gas-generating composition ~~which~~ that is based on substantially nontoxic starting materials and ~~which~~ that produces substantially nontoxic reaction products. It would be another advance in the art to provide a ~~gas generating~~ gas-generating composition ~~which~~ that produces very limited amounts of toxic or irritating particulate debris and limited undesirable gaseous products. It would also be an advance to provide a ~~gas generating~~ gas-generating composition ~~which~~ that forms a readily filterable solid slag upon reaction.

Please amend the first paragraph on page 6 as follows:

The present invention is related to the use of complexes of transition metals or alkaline earth metals as ~~gas generating~~ gas-generating compositions. These complexes are comprised of a metal cation and a neutral ligand containing hydrogen and nitrogen. One or more oxidizing anions are provided to balance the charge of the complex. Examples of typical oxidizing anions ~~which~~ that can be used include nitrates, nitrites, chlorates, perchlorates, peroxides, and superoxides. In some cases the oxidizing anion is part of the metal cation coordination complex. The complexes are formulated such that when the complex combusts, a mixture of gases containing nitrogen gas and water vapor are produced. A binder can be provided to improve the crush strength and other mechanical properties of the gas generant composition. A co-oxidizer can also be provided primarily to permit efficient combustion of the binder. Importantly, the production of undesirable gases or particulates is substantially reduced or eliminated.

Please amend the paragraph bridging pages 6 and 7 as follows:

The metals incorporated within the complexes are transition metals, alkaline earth metals, metalloids, or lanthanide metals that are capable of forming ammine or hydrazine complexes.

The presently preferred metal is cobalt. Other metals ~~which~~ that also form complexes with the properties desired in the present invention include, for example, magnesium, manganese, nickel, titanium, copper, chromium, zinc, and tin. Examples of other usable metals include rhodium, iridium, ruthenium, palladium, and platinum. These metals are not as preferred as the metals mentioned above, primarily because of cost considerations.

Please amend the paragraph bridging pages 7 and 8 as follows:

It is within the scope of the present invention to include metal complexes which contain a common ligand in addition to the neutral ligand. A few typical common ligands include: aquo (H_2O), hydroxo (OH), carbonato (CO_3), oxalato (C_2O_4), cyano (CN), isocyanato (NC), chloro (Cl), fluoro (F), and similar ligands. The metal complexes within the scope of the present invention are also intended to include a common counter ion, in addition to the oxidizing anion, to help balance the charge of the complex. A few typical common counter ions include: hydroxide (OH^-), chloride (Cl^-), fluoride (F^-), cyanide (CN^-), carbonate (CO_3^{-2}), phosphate ~~(PO_4^{-3}),~~ (PO_4^{-3}), oxalate ($C_2O_4^{-2}$), borate (BO_4^{-5}), ammonium (NH_4^+), and the like.

Please amend the paragraph bridging pages 8 and 9 as follows:

As discussed above, the present invention is related to gas generant compositions containing complexes of transition metals or alkaline earth metals. These complexes are comprised of a metal cation template and a neutral ligand containing hydrogen and nitrogen. One or more oxidizing anions are provided to balance the charge of the complex. In some cases the oxidizing anion is part of the coordination complex with the metal cation. Examples of typical oxidizing anions ~~which~~ that can be used include nitrates, nitrites, chlorates, perchlorates, peroxides, and superoxides. The complexes can be combined with a binder or mixture of binders to improve the crush strength and other mechanical properties of the gas generant composition. A co-oxidizer can be provided primarily to permit efficient combustion of the binder.

Please amend the first paragraph on page 9 as follows:

Metal complexes ~~which~~ that include at least one common ligand in addition to the neutral ligand are also included within the scope of the present invention. As used herein, the term common ligand includes well known ligands used by inorganic chemists to prepare coordination complexes with metal cations. The common ligands are preferably polyatomic ions or molecules, but some monoatomic ions, such as halogen ions, may also be used. Examples of common ligands within the scope of the present invention include aquo (H_2O), hydroxo (OH), perhydroxo (O_2H), peroxo (O_2), carbonato (CO_3), oxalato (C_2O_4), carbonyl (CO), nitrosyl (NO), cyano (CN), isocyanato (NC), isothiocyanato (NCS), thiocyanato (SCN), chloro (Cl), fluoro (F), amido (NH_2), imdo (NH), sulfato (SO_4), phosphato (PO_4), ethylenediaminetetraacetic acid (EDTA), and similar ligands. See, F. Albert Cotton and Geoffrey Wilkinson, *Advanced Inorganic Chemistry*, 2nd ed., John Wiley & Sons, pp. 139-142, 1966 and James E. Huheey, *Inorganic Chemistry*, 3rd ed., Harper & Row, pp. A-97-A-107, 1983, which are incorporated herein by reference. Persons skilled in the art will appreciate that suitable metal complexes within the scope of the present invention can be prepared containing a neutral ligand and another ligand not listed above.

Please amend the paragraph bridging pages 9 and 10 as follows:

In some cases, the complex can include a common counter ion, in addition to the oxidizing anion, to help balance the charge of the complex. As used herein, the term common counter ion includes well known anions and cations used by inorganic chemists as counter ions. Examples of common counter ions within the scope of the present invention include hydroxide (OH^-), chloride (Cl^-), fluoride (F^-), cyanide (CN^-), thiocyanate (SCN^-), carbonate (CO_3^{-2}), sulfate (SO_4^{-2}), phosphate (PO_4^{-3}), oxalate ($C_2O_4^{-2}$), borate (BO_4^{-5}), ammonium (NH_4^+), and the like. See, Whitten, K.W., and Gailey, K.D., *General Chemistry*, Saunders College Publishing, p. 167, 1981 and James E. Huheey, *Inorganic Chemistry*, 3rd ed., Harper & Row, pp. ~~A-97-A-103,~~ A-97-A-103, 1983, which are incorporated herein by reference.

Please amend the first paragraph on page 10 as follows:

The gas generant ingredients are formulated such that when the composition combusts, nitrogen gas and water vapor are produced. In some cases, small amounts of carbon dioxide or carbon monoxide are produced if a binder, co-oxidizer, common ligand or oxidizing anion contain carbon. The total carbon in the gas generant composition is carefully controlled to prevent excessive generation of CO gas. The combustion of the gas generant takes place at a rate sufficient to qualify such materials for use as ~~gas generating~~ gas-generating compositions in automobile air bags and other similar types of devices. Importantly, the production of other undesirable gases or particulates is substantially reduced or eliminated.

Please amend the paragraph bridging pages 10 and 11 as follows:

Complexes ~~which~~ that fall within the scope of the present invention include metal nitrate ammines, metal nitrite ammines, metal perchlorate ammines, metal nitrite hydrazines, metal nitrate hydrazines, metal perchlorate hydrazines, and mixtures thereof. Metal ammine complexes are defined as coordination complexes including ammonia as the coordinating ligand. The ammine complexes can also have one or more oxidizing anions, such as nitrite (NO_2^-), nitrate (NO_3^-), chlorate (ClO_3^-), perchlorate (ClO_4^-), peroxide (O_2^{2-}), and super-oxide (O_2^-), or mixtures thereof, in the complex. The present invention also relates to similar metal hydrazine complexes containing corresponding oxidizing anions.

Please amend the second paragraph on page 11 as follows:

Compositions such as sodium nitrite and ammonium sulfate in combination have little utility as ~~gas generating~~ gas-generating substances. These materials are observed to undergo metathesis ~~reactions~~ reactions, which result in unstable ammonium nitrite. In addition, most simple nitrite salts have limited stability.

Please amend the paragraph bridging pages 11 and 12 as follows:

In contrast, the metal complexes used in the present invention are stable materials ~~which,~~ that, in certain instances, are capable of undergoing the type of reaction set forth above. The complexes of the present invention also produce reaction products ~~which~~ that include desirable quantities of nontoxic ~~gases~~ gases, such as water vapor and nitrogen. In addition, a stable metal, or metal oxide slag is formed. Thus, the compositions of the present invention avoid several of the limitations of existing sodium azide ~~gas generating~~ gas-generating compositions.

Please amend the first paragraph on page 12 as follows:

Any transition metal, alkaline earth metal, metalloid, or lanthanide metal ~~which is~~ capable of forming the complexes described herein is a potential candidate for use in these ~~gas generating~~ gas-generating compositions. However, considerations such as cost, reactivity, thermal stability, and toxicity may limit the most preferred group of metals.

Please amend the second paragraph on page 12 as follows:

The presently preferred metal is cobalt. Cobalt forms stable complexes ~~which~~ that are relatively inexpensive. In addition, the reaction products of cobalt complex combustion are relatively nontoxic. Other preferred metals include magnesium, manganese, copper, zinc, and tin. Examples of less preferred but usable metals include nickel, titanium, chromium, rhodium, iridium, ruthenium, and platinum.

Please amend the third paragraph on page 12 (not including the list) as follows:

A few representative examples of ammine complexes within the scope of the present invention, and the associated ~~gas generating~~ gas-generating decomposition reactions are as follows:

Please amend the first (and only full) paragraph on page 13 (not including the list) as follows:

A few representative examples of hydrazine complexes within the scope of the present invention, and related ~~gas generating~~ gas-generating reactions are as follows:

Please amend the first paragraph on page 14 as follows:

While the complexes of the present invention are relatively stable, it is also simple to initiate the combustion reaction. For example, if the complexes are contacted with a hot wire, rapid gas producing combustion reactions are observed. Similarly, it is possible to initiate the reaction by means of conventional igniter devices. One type of igniter device includes a quantity of B/KNO_3 granules or pellets ~~which~~ that is ignited, and which in turn is capable of igniting the compositions of the present invention. Another igniter device includes a quantity of $Mg/Sr(NO_3)_2$/nylon granules.

Please amend the paragraph bridging pages 15 and 16 as follows:

Preparation of metal nitrite or nitrate ammine complexes of the present invention is described in the literature. Specifically, reference is made to Hagel et al., "The Triamines of Cobalt (III). I. Geometrical Isomers of Trinitrotriamminecobalt(III)," 9 *Inorganic Chemistry* 1496 (June 1970); G. Pass and H. Sutcliffe, *Practical Inorganic Chemistry*, 2nd Ed., Chapman & Hull, New York, 1974; Shibata et al., "Synthesis of Nitroammine- and Cyanoamminecobalt (III) Complexes With Potassium Tricarbonatocobaltate (III) as the Starting Material," 3 *Inorganic Chemistry* 1573 (Nov. 1964); Wieghardt et al., "μ-Carboxylatodi-μ-hydroxo-bis[triamminecobalt (III)] Complexes," 23 *Inorganic Synthesis* 23 (1985); Laing, "*mer*- and ~~*fac*~~ *fac*-$[Co(NH_3)_3NO_2)_3]$: Do They Exist?" 62 *J. Chem Educ.*, 707 (1985); Siebert, "Isomere des Trinitrotriamminkobalt (III)," 441 *Z. Anorg. Allg. Chem.* 47 (1978); all of which are incorporated herein by this reference. Transition metal perchlorate ammine complexes are synthesized by similar methods. As mentioned above, the ammine complexes of the present invention are generally stable and safe for use in preparing ~~gas generating~~ gas-generating formulations.

Please amend the paragraph bridging pages 16 and 17 as follows:

The described complexes can be processed into usable granules or pellets for use in ~~gas generating~~ gas-generating devices. Such devices include automobile air bag supplemental restraint systems. Such ~~gas generating~~ gas-generating compositions will comprise a quantity of the described complexes and preferably, a binder and a co-oxidizer. The compositions produce a mixture of gases, principally nitrogen and water vapor, upon decomposition or burning. The ~~gas generating~~ gas-generating device will also include means for initiating the burning of the composition, such as a hot wire or igniter. In the case of an automobile air bag system, the system will include the compositions described above; a collapsed, inflatable air bag; and means for igniting ~~said~~ the gas-generating composition within the air bag system. Automobile air bag systems are well known in the art.

Please amend the first paragraph on page 17 as follows:

Typical binders used in the ~~gas generating~~ gas-generating compositions of the present invention include binders conventionally used in propellant, pyrotechnic and explosive compositions including, but not limited to, lactose, boric acid, ~~silicates~~ silicates, including magnesium silicate, polypropylene carbonate, polyethylene glycol, naturally occurring ~~gums~~ gums, such as guar gum, acacia gum, modified celluloses and starches (a detailed discussion of such gums is provided by C.L. Mantell, *The Water-Soluble Gums*, Reinhold Publishing Corp., 1947, which is incorporated herein by reference), polyacrylic acids, nitrocellulose, polyacrylamide, polyamides, including nylon, and other conventional polymeric binders. Such binders improve mechanical properties or provide enhanced crush strength. Although water immiscible binders can be used in the present invention, it is currently preferred to use water soluble binders. The binder concentration is preferably in the range from 0.5 to 12% by weight, and more preferably from 2% to 8% by weight of the gas generant composition.

Please amend the paragraph bridging pages 17 and 18 as follows:

Applicants have found that the addition of ~~carbon~~ carbon, such as carbon black or activated ~~charcoal~~ charcoal, to gas generant compositions improves binder action ~~significantly~~ significantly, perhaps by reinforcing the binder ~~and~~ and, thus, forming a micro-composite. Improvements in crush strength of 50% to 150% have been observed with the addition of carbon black to compositions within the scope of the present invention. Ballistic reproducibility is enhanced as crush strength increases. The carbon concentration is preferably in the range of 0.1% to 6% by weight, and more preferably from 0.3 to 3% by weight of the gas generant composition.

Please amend the first paragraph on page 18 as follows:

The co-oxidizer can be a conventional ~~oxidizer~~ oxidizer, such as alkali, alkaline earth, lanthanide, or ammonium perchlorates, chlorates, peroxides, nitrites, and nitrates, including for example, $Sr(NO_3)_2$, NH_4ClO_4, KNO_3, and $(NH_4)_2Ce(NO_3)_6$.

Please amend the second paragraph on page 18 as follows:

The co-oxidizer can also be a ~~metal containing~~ metal-containing oxidizing ~~agent~~ agent, such as metal oxides, metal hydroxides, metal peroxides, metal oxide hydrates, metal oxide hydroxides, metal hydrous oxides, and mixtures thereof, including those described in U.S. Patent No. 5,439,537 issued August 8, 1995, titled "Thermite Compositions for Use as Gas Generants," which is incorporated herein by reference. Examples of metal oxides include, among others, the oxides of copper, cobalt, manganese, tungsten, bismuth, molybdenum, and iron, such as CuO, Co_2O_3, Co_3O_4, $CoFe_2O_4$, Fe_2O_3, MoO_3, Bi_2MoO_6, and Bi_2O_3. Examples of metal hydroxides include, among others, $Fe(OH)_3$, $Co(OH)_3$, $Co(OH)_2$, $Ni(OH)_2$, $Cu(OH)_2$, and $Zn(OH)_2$. Examples of metal oxide hydrates and metal hydrous oxides include, among others, $Fe_2O_3 \cdot xH_2O$, $SnO_2 \cdot xH_2O$, and $MoO_3 \cdot H_2O$. Examples of metal oxide hydroxides include, among others, $CoO(OH)_2$, $FeO(OH)_2$, $MnO(OH)_2$ and $MnO(OH)_3$.

Please amend the paragraph bridging pages 18 and 19 as follows:

The co-oxidizer can also be a basic metal ~~carbonate~~ carbonate, such as metal carbonate hydroxides, metal carbonate oxides, metal carbonate hydroxide oxides, and hydrates and mixtures thereof and a basic metal ~~nitrate~~ nitrate, such as metal hydroxide nitrates, metal nitrate oxides, and hydrates and mixtures thereof, including those oxidizers described in U.S. ~~patent number~~ Patent No. 5,429,691, titled "Thermite Compositions for use as Gas Generants," which is incorporated herein by reference.

Please amend the paragraph bridging pages 20 and 21 as follows:

The present compositions can also include additives conventionally used in ~~gas generating~~ gas-generating compositions, propellants, and explosives, such as burn rate modifiers, slag formers, release agents, and additives ~~which~~ that effectively remove NO_x. Typical burn rate modifiers include Fe_2O_3, $K_2B_{12}H_{12}$, Bi_2MoO_6, and graphite carbon powder or fibers. A number of slag forming agents are known and include, for example, clays, talcs, silicon oxides, alkaline earth oxides, hydroxides, oxalates, of which magnesium carbonate, and magnesium hydroxide are exemplary. A number of additives and/or agents are also known to reduce or eliminate the oxides of nitrogen from the combustion products of a gas generant composition, including alkali metal salts and complexes of tetrazoles, aminotetrazoles, triazoles and related nitrogen heterocycles of which potassium aminotetrazole, sodium carbonate and potassium carbonate are exemplary. The composition can also include materials ~~which~~ that facilitate the release of the composition from a mold such as graphite, molybdenum sulfide, calcium stearate, or boron nitride.

Please amend the first paragraph on page 21 as follows:

Typical ignition aids/burn rate modifiers ~~which~~ that can be used herein include metal oxides, nitrates and other ~~compounds~~ compounds, such as, for instance, Fe_2O_3, $K_2B_{12}H_{12} \cdot H_2O$, $BiO(NO_3)$, Co_2O_3, $CoFe_2O_4$, $CuMoO_4$, Bi_2MoO_6, MnO_2, $Mg(NO_3)_2 \cdot xH_2O$, $Fe(NO_3)_3 \cdot xH_2O$, $Co(NO_3)_2 \cdot xH_2O$, and NH_4NO_3. Coolants include magnesium hydroxide, cupric

oxalate, boric acid, aluminum hydroxide, and silicotungstic acid. Coolants such as aluminum hydroxide and silicotungstic acid can also function as slag enhancers.

Please amend the second paragraph on page 21 as follows:

It will be appreciated that many of the foregoing additives may perform multiple functions in the gas generant ~~formulation~~ formulation, such as a co-oxidizer or as a fuel, depending on the compound. Some compounds may function as a co-oxidizer, burn rate modifier, coolant, and/or slag former.

Please amend the paragraph bridging pages 22 and 23 as follows:

The ~~gas generating~~ gas-generating compositions of the present invention are readily adapted for use with conventional hybrid air bag inflator technology. Hybrid inflator technology is based on heating a stored inert gas (argon or helium) to a desired temperature by burning a small amount of propellant. Hybrid inflators do not require cooling filters used with pyrotechnic inflators to cool combustion gases, because hybrid inflators are able to provide a lower temperature gas. The gas discharge temperature can be selectively changed by adjusting the ratio of inert gas weight to propellant weight. The higher the gas weight to propellant weight ratio, the cooler the gas discharge temperature.

Please amend the first paragraph on page 23 as follows:

A hybrid ~~gas generating~~ gas-generating system comprises a pressure tank having a rupturable opening, a pre-determined amount of inert gas disposed within that pressure tank; a ~~gas generating~~ gas-generating device for producing hot combustion gases and having means for rupturing the rupturable opening; and means for igniting the ~~gas generating~~ gas-generating composition. The tank has a rupturable ~~opening~~ opening, which can be broken by a piston when the ~~gas generating~~ gas-generating device is ignited. The ~~gas generating~~ gas-generating device is configured and positioned relative to the pressure tank so that hot combustion gases are mixed with and heat the inert gas. Suitable inert gases include, among others, argon, helium and

mixtures thereof. The mixed and heated gases exit the pressure tank through the opening and ultimately exit the hybrid inflator and deploy an inflatable bag or balloon, such as an automobile air bag.

Please amend the second paragraph on page 23 as follows:

Preferred embodiments of the invention yield combustion products with a temperature greater than about 1800°K, the heat of which is transferred to the cooler inert gas causing a further improvement in the efficiency of the hybrid ~~gas generating~~ gas-generating system.

Please amend the first paragraph on page 24 as follows:

Hybrid ~~gas generating~~ gas-generating devices for supplemental safety restraint application are described in Frantom, Hybrid Airbag Inflator Technology, *Airbag Int'l Symposium on Sophisticated Car Occupant Safety Systems*, (Weinbrenner-Saal, Germany, Nov. 2-3, 1992).

Please amend the paragraph bridging pages 24 and 25 as follows:

A quantity (132.4 g) of $Co (NH_3)_3 (NO_2)_3$, prepared according to the teachings of Hagel et al., "The Triamines of Cobalt (III). I. Geometrical Isomers of Trinitrotriamminecobalt (III)," 9 *Inorganic Chemistry* 1496 (June 1970), was slurried in 35 mL of methanol with 7 g of a 38 percent by weight solution of pyrotechnic grade vinyl acetate/vinyl alcohol polymer resin commonly known as VAAR dissolved in methyl acetate. The solvent was allowed to partially evaporate. The paste-like mixture was forced through a 20-mesh sieve, allowed to dry to a stiff consistency, and forced through a sieve yet again. The granules resulting were then dried in vacuo at ambient temperature for 12 hours. ~~One half inch~~ One-half-inch diameter pellets of the dried material were prepared by pressing. The pellets were combusted at several different pressures ranging from 600 to 3,300 psig. The burning rate of the generant was found to be 0.237 ~~inches~~ inch per second at 1,000 psig with a pressure exponent of 0.85 over the pressure range tested.

Please amend the first paragraph on page 25 as follows:

The procedure of Example 1 was repeated with 100 g of Co $(NH_3)_3$ $(NO_2)_3$ and 34 g of 12 percent by weight solution of nylon in methanol. Granulation was accomplished via 10- and 16-mesh screens followed by air drying. The burn rate of this composition was found to be 0.290 ~~inches~~ inch per second at 1,000 psig with a pressure exponent of 0.74.

Please amend the paragraph bridging pages 25 and 26 as follows:

In a manner similar to that described in Example 1, 400 g of Co $(NH_3)_3$ $(NO_2)_3$ was slurried with 219 g of a 12 percent by weight solution of nitrocellulose in acetone. The nitrocellulose contained 12.6 percent nitrogen. The solvent was allowed to partially evaporate. The resulting paste was forced through an 8-mesh sieve followed by a 24-mesh sieve. The resultant granules were dried in air overnight and blended with sufficient calcium stearate mold release agent to provide 0.3 percent by weight in the final product. A portion of the resulting material was pressed into ~~1/2 inch~~ 0.5-inch diameter pellets and found to exhibit a burn rate of 0.275 ~~inches~~ inch per second at 1,000 psig with a pressure exponent of 0.79. The remainder of the material was pressed into pellets ~~1/8 inch~~ 0.125-inch diameter by 0.07-inch thickness on a rotary tablet press. The pellet density was determined to be 1.88 g/cc. The theoretical flame temperature of this composition was 2,358°K and was calculated to provide a gas mass fraction of 0.72.

Please amend the paragraph bridging pages 26 and 27 as follows:

This example discloses the preparation of a reusable stainless steel test fixture used to simulate driver's side gas generators. The test fixture, or simulator, consisted of an igniter chamber and a combustion chamber. The igniter chamber was situated in the center and had 24, ~~0.10 inch~~ 0.10-inch diameter ports exiting into the combustion chamber. The igniter chamber was fitted with an igniter squib. The igniter chamber wall was lined with ~~0.001 inch~~ 0.001-inch thick aluminum foil before ~~-24/+60 mesh~~ -24/+60-mesh igniter granules were added. The outer

combustion chamber wall consisted of a ring with nine exit ports. The diameter of the ports was varied by changing rings. Starting from the inner diameter of the outer combustion chamber ring, the combustion chamber was fitted with a ~~0.004 inch~~ 0.004-inch aluminum shim, one wind of ~~30 mesh~~ 30-mesh stainless steel screen, four winds of a ~~14 mesh~~ 14-mesh stainless steel screen, a deflector ring, and the gas generant. The generant was held intact in the combustion chamber using a "donut" of ~~18 mesh~~ 18-mesh stainless steel screen. An additional deflector ring was placed around the outside diameter of the outer combustion chamber wall. The combustion chamber was fitted with a pressure port. The simulator was attached to either a ~~60 liter~~ 60-liter tank or an automotive air bag. The tank was fitted with pressure, temperature, vent, and drain ports. The automotive air bags have a maximum capacity of 55 liters and are constructed with two ~~1/2 inch~~ 0.5-inch diameter vent ports. Simulator tests involving an air bag were configured such that bag pressures were measured. The external skin surface temperature of the bag was monitored during the inflation event by infrared radiometry, thermal imaging, and thermocouple.

Please amend the first paragraph on page 27 as follows:

Thirty-seven and one-half grams of the ~~1/8 inch~~ 0.125-inch diameter pellets prepared as described in Example 3 were combusted in an inflator test device vented into a ~~60 L~~ 60-L collection tank as described in Example 4, with the additional incorporation of a second screened chamber containing ~~2~~ two winds of ~~30 mesh~~ 30-mesh screen and ~~2~~ two winds of ~~18 mesh~~ 18-mesh screen. The combustion produced a combustion chamber pressure of 2,000 psia and a pressure of 39 psia in the ~~60 L~~ 60-L collection tank. The temperature of the gases in the collection tank reached a maximum of 670°K at 20 milliseconds. Analysis of the gases collected in the ~~60 L~~ 60-L tank showed a concentration of nitrogen oxides (NO_x) of 500 ppm and a concentration of carbon monoxide of 1,825 ppm. Total expelled particulate as determined by rinsing the tank with methanol and evaporation of the rinse was found to be 1,000 mg.

Please amend the first paragraph on page 28 as follows:

The test of Example 4 was ~~repeated~~ repeated, except that the ~~60 L~~ 60-L tank was replaced with a ~~55 L~~ 55-L vented bag as typically employed in driver side automotive inflator restraint devices. A combustion chamber pressure of 1,900 psia was obtained with a full inflation of the bag occurring. An internal bag pressure of 2 psig at peak was observed at approximately 60 milliseconds after ignition. The bag surface temperature was observed to remain below ~~83°C~~ 83°C, which is an improvement over conventional azide-based inflators, while the bag inflation performance is quite typical of conventional systems.

Please amend the second paragraph on page 28 as follows:

The nitrate salt of copper tetraammine was prepared by dissolving 116.3 g of copper (II) nitrate hemipentahydrate in 230 mL of concentrated ammonium hydroxide and 50 mL of water. Once the resulting warm mixture had cooled to 40°C, one liter of ethanol was added with stirring to precipitate the tetraammine nitrate product. The dark purple-blue solid was collected by filtration, washed with ethanol, and air dried. The product was confirmed to be $Cu(NH_3)_4(NO_3)_2$ by elemental analysis. The burning rate of this material as determined from pressed ~~1/2-inch~~ 0.5-inch diameter pellets was 0.18 ~~inches~~ inch per second at 1,000 psig.

Please amend the first paragraph on page 29 (not including table) as follows:

The tetraammine copper nitrate prepared in Example 7 was formulated with various supplemental oxidizers and tested for burning rate. In all cases, 10 g of material were slurried with approximately 10 mL of methanol, dried, and pressed into ~~1/2-inch~~ 0.5-inch diameter pellets. Burning rates were measured at 1,000 psig, and the results are shown in the following table.

Please amend the second paragraph on page 29 as follows:

A quantity of hexaamminecobalt (III) nitrate was prepared ~~by a~~ by replacing ammonium chloride with ammonium nitrate in the procedure for preparing of hexaamminecobalt (III)

chloride as taught by G. Pass and H. Sutcliffe, *Practical Inorganic Chemistry*, 2nd Ed., Chapman & Hull, New York, 1974. The material prepared was determined to be $[Co\ (NH_3)_6]\ (NO_2)_3$ by elemental analysis. A sample of the material was pressed into ~~1/2-inch~~ 0.5-inch diameter pellets and a burning rate of 0.26 ~~inches~~ inch per second measured at 2,000 psig.

Please amend the first paragraph on page 30 (not including table) as follows:

The material prepared in Example 9 was used to prepare three lots of gas generant containing hexaamminecobalt (III) nitrate as the fuel and ceric ammonium nitrate as the ~~co-oxidizer.~~ co-oxidizer. The lots differ in mode of processing and the presence or absence of additives. Burn rates were determined from ~~1/2 inch~~ 0.5-inch diameter burn rate pellets. The results are summarized below:

Please amend the second paragraph on page 30 (not including table) as follows:

The material prepared in Example 9 was used to prepare several 10-g mixes of generant compositions utilizing various supplemental oxidizers. In all cases, the appropriate amount of hexaamminecobalt (III) nitrate and co-oxidizer(s) were blended into approximately 10 mL of methanol, allowed to dry, and pressed into ~~1/2-inch~~ 0.5-inch diameter pellets. The pellets were tested for burning rate at 1,000 psig, and the results are shown in the following table.

Please amend the first paragraph on page 31 (not including table) as follows:

Binary compositions of hexaamminecobalt (III) nitrate ("HACN") and various supplemental oxidizers were blended in 20 gram batches. The compositions were dried for 72 hours at 200°F and pressed into ~~1/2-inch~~ 0.5-inch diameter pellets. Burn rates were determined by burning the ~~1/2 inch~~ 1/2-inch pellets at different pressures ranging from 1000 to 4000 psi. The results are shown in the following table.

Please amend the paragraph bridging pages 32 and 33 as follows:

A processing method was devised for preparing small parallelepipeds ("pps.") of gas generant on a laboratory scale. The equipment necessary for forming and cutting the pps. included a cutting table, a roller and a cutting device. The cutting table consisted of a 9 inch x 18 inch sheet of metal with ~~0.5 inch~~ 0.5-inch wide paper spacers taped along the lengthwise edges. The spacers had a cumulative height of 0.043 inch. The roller consisted of a 1 foot long, ~~2 inch~~ 2-inch diameter cylinder of teflon. The cutting device consisted of a shaft, cutter blades and spacers. The shaft was a ~~1/4 inch~~ 0.25-inch bolt upon which a series of seventeen ~~3/4 inch~~ 0.75-inch diameter, ~~0.005 inch~~ 0.005-inch thick stainless steel washers were placed as cutter blades. Between each cutter blade, four ~~2/3 inch~~ 0.66-inch diameter, ~~0.020 inch~~ 0.020-inch thick brass spacer washers were placed and the series of washers were secured by means of a nut. The repeat distance between the circular cutter blades was 0.085 inch.

Please amend the paragraph bridging pages 33 and 34 as follows:

The velostat plastic sheet upon which the generant had been rolled and cut was unfastened from the cutting table and placed lengthwise over a ~~4 inch~~ 4-inch diameter cylinder in a 135°F convection oven. After approximately 10 minutes, the sheet was taken out of the oven and placed over a ~~1/2 inch~~ 0.5-inch diameter rod so that the two ends of the plastic sheet formed an acute angle relative to the rod. The plastic was moved back and forth over the rod so as to open up the cuts between the parallelepipeds ("pps."). The sheet was placed widthwise over the ~~4 inch~~ four-inch diameter cylinder in the 135°F convection oven and allowed to dry for another 5 minutes. The cuts were opened between the pps. over the ~~1/2 inch~~ 0.5-inch diameter rod as before. By this time, it was quite easy to detach the pps. from the plastic. The pps. were separated from each other further by rubbing them gently in a pint cup or on the screens of a ~~12 mesh~~ 12-mesh sieve. This method breaks the pps. into singlets with some remaining doublets. The doublets were split into singlets by use of a razor blade. The pps. were then placed in a convection oven at 165-225°F to dry them completely. The crush strengths (on edge) of the pps. thus formed were typically as great or greater than those of ~~1/8~~ 0.125-inch diameter pellets with

a ~~1/4 inch~~ 0.25-inch convex radius of curvature and a ~~0.070 inch~~ 0.070-inch maximum height ~~which~~ that were formed on a rotary press. This is noteworthy since the latter are three times as massive.

Please amend the paragraph bridging pages 34 and 35 as follows:

A ~~gas generating~~ gas-generating composition was prepared utilizing hexaamminecobalt (III) nitrate, $[(NH_3)_6Co](NO_3)_3$, powder (78.07%, 39.04 g), ammonium nitrate granules (19.93%, 9.96 g), and ground polyacrylamide, MW 15 million (2.00%, 1.00 g). The ingredients were dry-blended in a Spex mixer/mill for one minute. Deionized water (12% of the dry weight of the formulation, 6 g) was added to the ~~mixture~~ mixture, which was blended for an additional five minutes on the Spex mixer/mill. This resulted in material with a dough-like ~~consistency~~ consistency, which was processed into parallelepipeds (pps.) as in Example 13. Three additional batches of generant were mixed and processed similarly. The pps. from the four batches were blended. The dimensions of the pps. were 0.052 inch x 0.072 inch x 0.084 inch. Standard deviations on each of the dimensions were on the order of 0.010 inch. The average weight of the pps. was 6.62 mg. The bulk density, density as determined by dimensional measurements, and density as determined by solvent displacement were determined to be 0.86 g/cc, 1.28 g/cc, and 1.59 g/cc, respectively. Crush strengths of 1.7 kg (on the narrowest edge) were measured with a standard deviation of 0.7 kg. Some of the pps. were pressed into ~~1/2 inch~~ 0.5-inch diameter pellets weighing approximately three grams. From these pellets the burn rate was determined to be 0.13 ips at 1000 psi with a pressure exponent of 0.78.

Please amend the paragraph bridging pages 35 and 36 as follows:

A simulator was constructed according to Example 4. Two grams of a stoichiometric blend of $Mg/Sr(NO_3)_2$/nylon igniter granules were placed into the igniter chamber. The diameter of the ports exiting the outer combustion chamber wall were ~~3/16~~ 0.1875 inch. Thirty grams of generant described in Example 14 in the form of parallelepipeds were secured in the combustion chamber. The simulator was attached to the ~~60 L~~ 60-L tank described in Example 4.

After ignition, the combustion chamber reached a maximum pressure of 2300 psia in 17 milliseconds, the ~~60 L~~ 60-L tank reached a maximum pressure of 34 psia and the maximum tank temperature was 640°K. The NO_X, CO and NH_3 levels were 20, 380, and 170 ppm, respectively, and 1600 mg of particulate were collected from the tank.

Please amend the first paragraph on page 36 as follows:

A simulator was constructed with the exact same igniter and generant type and charge weight as in Example 15. In ~~addition~~ addition, the outer combustion chamber exit port diameters were identical. The simulator was attached to an automotive safety bag of the type described in Example 4. After ignition, the combustion chamber reached a maximum pressure of 2000 psia in 15 milliseconds. The maximum pressure of the inflated air bag was 0.9 psia. This pressure was reached 18 milliseconds after ignition. The maximum bag surface temperature was 67°C.

Please amend the paragraph bridging pages 36 and 37 as follows:

A ~~gas generating~~ gas-generating composition was prepared utilizing hexaamminecobalt (III) nitrate powder (76.29%, 76.29 g), ammonium nitrate granules (15.71%, 15.71 g, Dynamit Nobel, granule size: <350 micron), cupric oxide powder formed pyrometallurgically (5.00%, 5.00 g) and guar gum (3.00%, 3.00 g). The ingredients were dry-blended in a Spex mixer/mill for one minute. Deionized water (18% of the dry weight of the formulation, 9 g) was added to 50 g of the mixture which was blended for an additional five minutes on the Spex mixer/mill. This resulted in material with a dough-like consistency which was processed into parallelepipeds (pps.) as in Example 13. The same process was repeated for the other 50 g of ~~dry-blended~~ dry-blended generant and the two batches of pps. were blended together. The average dimensions of the blended pps. were 0.070 inch x 0.081 inch x 0.088 inch. Standard deviations on each of the dimensions were on the order of 0.010 inch. The average weight of the pps. was 9.60 mg. The bulk density, density as determined by dimensional measurements, and density as determined by solvent displacement were determined to be 0.96 g/cc, 1.17 g/cc, and 1.73 g/cc,

respectively. Crush strengths of 5.0 kg (on the narrowest edge) were measured with a standard deviation of 2.5 kg. Some of the pps. were pressed into ~~1/2 inch~~ 0.5-inch diameter pellets weighing approximately three grams. From these pellets the burn rate was determined to be 0.20 ips at 1000 psi with a pressure exponent of 0.67.

Please amend the paragraph bridging pages 37 and 38 as follows:

A simulator was constructed according to Example 4. One gram of a stoichiometric blend of Mg/Sr $(NO_3)_2$/nylon and two grams of slightly over-oxidized B/KNO_3 igniter granules were blended and placed into the igniter chamber. The diameter of the ports exiting the outer combustion chamber wall were 0.166 inch. Thirty grams of generant described in Example 17 in the form of parallelepipeds (pps.) were secured in the combustion chamber. The simulator was attached to the ~~60 L~~ 60-L tank described in Example 4. After ignition, the combustion chamber reached a maximum pressure of 2540 psia in 8 milliseconds, the ~~60 L~~ 60-L tank reached a maximum pressure of 36 psia and the maximum tank temperature was 600°K. The NO_x, CO, and NH_3 levels were 50, 480, and 800 ppm, respectively, and 240 mg of particulate were collected from the tank.

Please amend the paragraph bridging pages 38 and 39 as follows:

A ~~gas generating~~ gas-generating composition was prepared utilizing hexaamminecobalt (III) nitrate powder (69.50%, 347.5 g), copper (II) trihydroxy nitrate, [$Cu_2(OH)_3NO_3$], powder (21.5%, 107.5 g), 10 micron RDX (5.00%, 25 g), 26 micron potassium nitrate (1.00%, 5 g) and guar gum (3.00%, 3.00 g). The ingredients were dry-blended with the assistance of a ~~60 mesh~~ 60-mesh sieve. Deionized water (23% of the dry weight of the formulation, 15 g) was added to 65 g of the ~~mixture~~ mixture, which was blended for an additional five minutes on the Spex mixer/mill. This resulted in material with a dough-like consistency ~~which~~ that was processed into parallelepipeds (pps.) as in Example 13. The same process was repeated for two additional 65 g batches of ~~dry-blended~~ dry-blended generant and the three batches of pps. were blended together. The

average dimensions of the pps. were 0.057 inch x 0.078 inch x 0.084 inch. Standard deviations on each of the dimensions were on the order of 0.010 inch. The average weight of the pps. was 7.22 mg. The bulk density, density as determined by dimensional measurements, and density as determined by solvent displacement were determined to be 0.96 g/cc, 1.23 g/cc, and 1.74 g/cc, respectively. Crush strengths of 3.6 kg (on the narrowest edge) were measured with a standard deviation of 0.9 kg. Some of the pps. were pressed into ~~1/2 inch~~ 0.5-inch diameter pellets weighing approximately three grams. From these pellets the burn rate was determined to be 0.27 ips at 1000 psi with a pressure exponent of 0.51.

Please amend the paragraph bridging pages 39 and 40 as follows:

A simulator was constructed according to Example 4. ~~1.5 grams of a~~ A stoichiometric blend of 1.5 grams of Mg/Sr $(NO_3)_2$/nylon and 1.5 grams of slightly over-oxidized B/KNO_3 igniter granules were blended and placed into the igniter chamber. The diameter of the ports exiting the outer combustion chamber wall were 0.177 inch. Thirty grams of generant described in Example 20 in the form of parallelepipeds (pps.) were secured in the combustion chamber. The simulator was attached to the ~~60 L~~ 60-L tank described in Example 4. After ignition, the combustion chamber reached a maximum pressure of 3050 psia in 14 milliseconds. The NO_x, CO, and NH_3 levels were 25, 800, and 90 ppm, respectively, and 890 mg of particulate were collected from the tank.

Please amend the paragraph bridging pages 40 and 41 as follows:

A ~~gas generating~~ gas-generating composition was prepared utilizing hexaamminecobalt (III) nitrate powder (78.00%, 457.9 g), copper (II) trihydroxy nitrate powder (19.00%, 111.5 g), and guar gum (3.00%, 17.61 g). The ingredients were dry-blended and then mixed with water (32.5% of the dry weight of the formulation, 191 g) in a Baker-Perkins pint mixer for 30 minutes. To a portion of the resulting wet cake (220 g), 9.2 additional grams of copper (II) trihydroxy nitrate and 0.30 additional grams of guar gum ~~were added~~ added, as well as 0.80 g of carbon

black (Monarch 1100). This new formulation was blended for 30 minutes on a Baker-Perkins mixer. The wet cake was placed in a ram extruder with a barrel diameter of 2 inches and a die orifice diameter of 3/32 inch (0.09038 inch). The extruded material was cut into lengths of about one foot, allowed to dry under ambient conditions overnight, placed into an enclosed container holding water in order to moisten and thus soften the material, chopped into lengths of about 0.1 inch and dried at 165°F. The dimensions of the resulting extruded cylinders were an average length of 0.113 ~~inches~~ inch and an average diameter of 0.091 ~~inches.~~ inch. The bulk density, density as determined by dimensional measurements, and density as determined by solvent displacement were 0.86 g/cc, 1.30 g/cc, and 1.61 g/cc, respectively. Crush strengths of 2.1 and 4.1 kg were measured on the circumference and axis, respectively. Some of the extruded cylinders were pressed into ~~1/2 inch~~ 0.5-inch diameter pellets weighing approximately three grams. From these pellets the burn rate was determined to be 0.22 ips at 1000 psi with a pressure exponent of 0.29.

Please amend the paragraph bridging pages 41 and 42 as follows:

Three simulators were constructed according to Example 4. ~~1.5 grams of a~~ A stoichiometric blend of 1.5 grams of Mg/Sr $(NO_3)_2$/nylon and 1.5 grams of slightly over-oxidized B/KNO_3 igniter granules were blended and placed into the igniter chambers. The diameter of the ports exiting the outer combustion chamber wall were 0.177 inch, 0.166 inch, and 0.152 inch, respectively. Thirty grams of generant described in Example 22 in the form of extruded cylinders were secured in each of the combustion chambers. The simulators were, in succession, attached to the ~~60 L~~ 60-L tank described in Example 4. After ignition, the combustion chambers reached a maximum pressure of 1585, 1665, and 1900 psia, respectively. Maximum tank pressures were 32, 34, and 35 psia, respectively. The NO_x levels were 85, 180, and 185 ppm whereas the CO levels were 540, 600, and 600 ppm, respectively. NH_3 levels were below 2 ppm. Particulate levels were 420, 350, and 360 mg, respectively

Please amend the first paragraph on page 43 as follows:

Hexaamminecobalt (III) nitrate was pressed into four gram pellets with a diameter of ~~1/2~~ 0.5 inch. One half of the pellets were weighed and placed in a 95°C oven for 700 hours. After aging, the pellets were weighed once again. No loss in weight was observed. The burn rate of the pellets held at ambient temperature was 0.16 ips at 1000 psi with a pressure exponent of 0.60. The burn rate of the pellets held at 95°C for 700 hours was 0.15 at 1000 psi with a pressure exponent of 0.68.

Please amend the paragraph bridging pages 43 and 44 (not including the table) as follows:

A ~~gas generating~~ gas-generating composition was prepared utilizing hexaamminecobalt (III) nitrate powder (76.00%, 273.6 g), copper (II) trihydroxy nitrate powder (16.00%, 57.6 g), 26 micron potassium nitrate (5.00%, 18.00 g), and guar gum (3.00%, 10.8 g). Deionized water (24.9% of the dry weight of the formulation, 16.2 g) was added to 65 g of the mixture which was blended for an additional five minutes on the Spex mixer/mill. This resulted in material with a dough-like ~~consistency~~ consistency, which was processed into parallelepipeds (pps.) as in Example 13. The same process was repeated for the other 50-65 g batches of dry-blended generant and all the batches of pps. were blended together. The average dimensions of the pps. were 0.065 inch x 0.074 inch x 0.082 inch. Standard deviations on each of the dimensions were on the order of 0.005 inch. The average weight of the pps. was 7.42 mg. The bulk density, density as determined by dimensional measurements, and density as determined by solvent displacement were determined to be 0.86 g/cc, 1.15 g/cc, and 1.68 g/cc, respectively. Crush strengths of 2.1 kg (on the narrowest edge) were measured with a standard deviation of 0.3 kg. Some of the pps. were pressed into ~~ten, one half inch~~ ten 0.5-inch diameter pellets weighing approximately three grams. Approximately 60 g of pps. and five ~~1/2 inch~~ 0.5-inch diameter pellets were placed in an oven held at 107°C. After 450 hours at this temperature, 0.25% and 0.41% weight losses were observed for the pps. and pellets, respectively. The remainder of the pps. and pellets were stored under ambient conditions. Burn rate data were obtained from both sets of pellets and are summarized in Table 4.

Please amend the paragraph bridging pages 44 and 45 (not including the table) as follows:

Two simulators were constructed according to Example 4. In each igniter chamber, a blended mixture of 1.5 g of a stoichiometric blend of Mg/Sr $(NO_3)_2$/nylon and 1.5 grams of slightly over-oxidized B/KNO_3 igniter granules were placed. The diameter of the ports exiting the outer combustion chamber wall in each simulator were 0.177 inch. Thirty grams of ambient aged generant described in Example 26 in the form of parallelepipeds were secured in the combustion chamber of one ~~simulator~~ simulator, whereas thirty grams of generant pps. aged at 107°C were placed in the other combustion chamber. The simulators were attached to the ~~60 L~~ 60-L tank described in Example 4. Test fire results are summarized in Table 5 below.

Please amend the first paragraph on page 45 as follows:

A mixture of $2Co(NH_3)_3(NO_2)_3$ and $Co(NH_3)_4(NO_2)_2Co(NH_3)_2(NO_2)_4$ was prepared and pressed in a pellet having a diameter of approximately 0.504 ~~inches.~~ inch. The complexes were prepared within the scope of the teachings of the Hagel, et al. reference identified above. The pellet was placed in a test bomb, which was pressurized to 1,000 psi with nitrogen gas.

Please amend the paragraph bridging pages 45 and 46 as follows:

The pellet was ignited with a hot wire and burn rate was measured and observed to be 0.38 ~~inches~~ inch per second. Theoretical calculations indicated a flame temperature of 1805°C. From theoretical calculations, it was predicted that the major reaction products would be solid CoO and gaseous reaction products. The major gaseous reaction products were predicted to be as follows:

Product	Volume %
H_2O	57.9
N_2	38.6
O_2	3.1

Please amend the second paragraph on page 46 (not including the table) as follows:

Theoretical calculations were undertaken for Co $(NH_3)_3$ $(NO_2)_3$. Those calculations indicated a flame temperature of about 2,000°K and a gas yield of about 1.75 times that of a conventional sodium azide ~~gas generating~~ gas-generating compositions based on equal volume of generating composition ("performance ratio"). Theoretical calculations were also undertaken for a series of ~~gas generating~~ gas-generating compositions. The composition and the theoretical performance data is set forth below in Table 6.

Please amend the paragraph bridging pages 47 and 48 (not including the table) as follows:

Pentaamminecobalt (III) nitrate complexes were ~~synthesized~~ synthesized, which contain a common ligand in addition to NH_3. Aquopentaamminecobalt (III) nitrate and pentaamminecarbonatocobalt (III) nitrate were synthesized according to *Inorg. Syn.*, vol. 4, p. 171 (1973). Pentaamminehydroxocobalt (III) nitrate was synthesized according to H.J.S. King, *J. Chem. Soc.*, p. 2105 (1925) and O. Schmitz, et al., *Zeit. Anorg. Chem.*, vol. 300, p. 186 (1959). Three lots of gas generant were prepared utilizing the pentaamminecobalt (III) nitrate complexes described above. In all cases guar gum was added as a binder. Copper (II) trihydroxy nitrate, $[Cu_2(OH)_3NO_3]$, was added as the co-oxidizer where needed. Burn rates were determined from ~~1/2 inch~~ 0.5-inch diameter burn rate pellets. The results are summarized below in Table 7.

Please amend the paragraph bridging pages 48 and 49 as follows:

In summary the present invention provides ~~gas generating~~ gas-generating materials that overcome some of the limitations of conventional azide-based ~~gas generating~~ gas-generating compositions. The complexes of the present invention produce nontoxic gaseous products including water vapor, oxygen, and nitrogen. Certain of the complexes are also capable of efficient decomposition to a metal or metal oxide, and nitrogen and water vapor. Finally, reaction temperatures and burn rates are within acceptable ranges.